MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2019 / 2020

PCO0165 – INTRODUCTION TO COMPUTER ARCHITECTURE AND OPERATING SYSTEM
(Foundation in Information Technology)

25 OCTOBER 2019
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 3 pages (excluding the cover page) with 5 questions only.

2. Answer **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the Answer Booklet provided.

Instructions: Answer **ALL** questions. Write your answers in the Answer Booklet.

QUESTION 1 [10 Marks]

a. Explain briefly why a software designer has to study computer architecture.

(2 marks)

b. List **FOUR (4)** computers developed in the first generations (1944 - 1958).

(2 marks)

c. Discuss the difference between CISC and RISC processors.

(4 marks)

d. State **TWO (2)** features of the Intel Centrino.

(2 marks)

QUESTION 2 [10 Marks]

a. Convert the following binary numbers to decimal equivalents. Show computation steps.
   i. 10110100.010_2
   ii. 11111100.111_2

(3 marks)

b. Convert the following hexadecimal notations to their binary equivalents. Show computation steps.
   i. $9CD.AB_{16}$
   ii. $7EF.66_{16}$

(3 marks)

c. Convert the following octal notations to decimal equivalents. Show computation steps.
   i. 167_8
   ii. 0.54_8

(3 marks)

d. Draw the basic floating-point number representation format using 32-bit floating point (IEEE-754)?

(1 mark)

QUESTION 3 [10 Marks]

a. Calculate the addition arithmetic operation of the following unsigned binary numbers. Show computation steps.
   i. $00110110 + 01110110$
   ii. $11101110 + 10111001$

(2 marks)

Continued...

b. Calculate the subtraction arithmetic operation of the following unsigned binary numbers. Show computation steps.
   i.   11001010 - 00110100
   ii. 11110111 - 10111101

(3 marks)

c. Solve the following addition operations using the two's complement addition in 5-bit for signed integer. Show computation steps.
   i.   9 + (-1)
   ii. (-2) + (7)

(3 marks)

d. Solve the subtraction operation (-8) - (-4) using the two's complement subtraction in 4-bit for signed integer. Show computation steps.

(2 marks)

QUESTION 4 [10 Marks]

a. List the **FOUR (4)** elements of machine instructions.

(2 marks)

b. Explain the meaning of the following assembly language instructions code.
   i.   MVI A, 40H
   ii.   LDA 6020H
   iii. STA 6010H
   iv.   LXI H, 3000H

(4 marks)

c. Write an assembly program based on the following steps:
   - Let say, the memory locations 6000H and 6001H contain the following operands:
     (6000H) = 14H
     (6001H) = 19H
   - Use an addition operation to add both operands.
   - Store the result in memory address 6002H.

(4 marks)

QUESTION 5 [10 Marks]

a. Explain briefly the nature of an operating system that was designed for larger system compared to a stand-alone personal computer.

(2 marks)

b. User interface (UI) is one of the most critical factors of designing an operating system because it brings structure to the interaction between a user and the computer. List and explain briefly the **TWO (2)** common types of user interface (UI) found in the operating system.

(2 marks)

Continued...

c. What is a utility program? Briefly discuss the functions of the following utility programs.
   i.   Optimize drive utility
   ii. Backup utility

(4 marks)

d. A file is a set of associated information that is written on secondary storage, typically with two types of view. Briefly explain the two types of view.

(2 marks)

End of Paper